

Remarks

Reconsideration of this application is respectfully requested.

The Advisory Action dated July 11, 2006 maintained the rejection under 35 U.S.C. § 103(a) in view of Welch et al., U.S. Patent Publication No. 2004-0065645 (“Welch”).

Independent claim 9 requires: "maintaining a predefined temperature inside a dome of the semiconductor processor during the time that the processor is processing substrates and when substrate processing is idle." Independent claim 15 requires, "continuously varying a clean dry air (CDA) flow responsive to temperatures changes in the domed process chamber, such that a dome temperature is stabilized in accordance with a preset temperature during a semiconductor manufacturing process and when processing is idle." Contrary to the Examiner's assertions, Welch does not disclose or suggest maintaining a predefined temperature, or temperature stabilization according to a preset temperature, during idling, a feature of claims 9 and 15, respectively; nor, would Welch have motivated one of ordinary skill in the art of semiconductor processing at the time Applicant's invention was made to modify the teachings of Welch to achieve such a method.

The Advisory Action alleges that Figures 6 and 7 of Welch, as well as paragraphs [0099] and [0101], teach a temperature-controlled idling process. Significantly, neither of these figures, nor their accompanying text discloses or suggests anything related to process idling.

Figure 6 in Welch is a graph of temperature versus time for three different dome configurations, one of which is an embodiment of the Welch disclosure. Time zero, the beginning point of the x-axis, is the time that plasma strikes the dome. There are no temperature measurements made prior to plasma striking the dome; that is, there are no temperature measurements recorded covering the period when the domes of Figure 6 are idling. Thus, there is no way to possibly know the conditions or control states of any of the domes of Figure 6 while they were idling (before time zero) – temperature control or otherwise.

More importantly, nothing in Welch discloses or suggests what conditions produced the temperature at time zero. The Examiner alleges that, since the temperature at time zero is close to the final temperature, the temperature must have been actively controlled prior to time zero.

However, that assumption is based on improper logic, and has no support in Welch. Although an active temperature control can result in a given temperature, the converse is not true. The existence of a given initial temperature as a starting condition in a graph cannot prove anything about the presence or absence of active control prior to time zero. The Examiner's finding of control at time zero in FIG. 6 is based on application of incorrect logic and impermissible hindsight.

Welch's disclosure "describes a method for increasing the efficiency of, and reducing the time required to stabilize or control the temperature of the dome of a chamber once RF energy has been applied." Figure 6 and paragraph [0099] clearly support Applicant's position and, contrary to the Action's allegation, do not disclose or suggest anything related to the operational parameters of a temperature controlled idling process.

Figure 7 in Welch is a graph of temperature versus time, in which an embodiment of Welch's dome is experimentally tested in four consecutive test runs. The Examiner alleges that, the apparently small temperature drops between the flat periods (when RF power is supplied) indicate that the temperature must have been controlled while the process is idle. Clearly, FIG. 7 shows that the temperature does drop when the process is idle. The Examiner has not introduced any evidence showing the natural thermal response of the system when there is no active thermal control during process idle times. The Examiner has not shown that the drop in temperature in FIG. 7 is in any way different from the drop in temperature that would be observed in the very brief interval between RF power runs if the temperature is not controlled during process idle times. The data shown in FIG. 7 would just as likely show the temperature for the case where the temperature is NOT controlled during process idle time, and is only controlled when RF power is supplied. The only basis for the position in the advisory action is impermissible hindsight. There is simply a lack of factual data to support such an allegation.

Figure 7 discloses temperature stabilization during RF power application. This is indicated, according to the Action, by the relatively horizontal lines between T₂ and T₃. However, comparing the period where no RF power is being applied, between T₃ and the subsequent T₂, Figure 7 shows an absolute lack of linearity for any of the temperature measurements during the period where no RF power is being applied. If Figure 7 "indicates" or "implies" anything, it is evidence that there is no temperature control during the period when RF

power is not supplied to the dome. The totality of Figure 7 and its accompanying textual descriptions, support what Welch has disclosed; namely rapid temperature stabilization once RF power has been applied. Figure 7 does not however, support in any manner a disclosure or suggestion of temperature control during process idling.

Welch states in paragraph [0102] that Figure 7 shows that steady temperature can be achieved within 33% of the deposition cycle, whereas the prior art had difficulty achieving any steady temperature. Welch states that the temperature fluctuation range of 7 – 10 degrees is significantly improved over the prior art's 25 degree fluctuation range. However, at no point does Welch indicate or even mention process idling in conjunction with Figure 7. Welch discusses temperature control during RF power application, and the improvements he has gained. The Patent and Trademark Office has not introduced any evidence that Welch's reduction in time to reach steady state and in temperature fluctuation is due to anything other than controlling temperature while applying RF power, as Welch describes.

Welch, at most, describes a method for reducing the time required to stabilize or control the temperature of the dome of a chamber once RF energy has been applied, i.e., at the initiation of and during the substrate processing. Nowhere in Welch is there any disclosure or suggestion, explicit or implicit, of a mechanism or method for stabilizing or maintaining a predefined temperature inside the dome of a semiconductor processor once the process is idle, as is claimed by Applicant.

In order to establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all of the claim limitations. MPEP § 2142. The Examiner has not satisfied these requirements, and therefore has failed to establish a prima facie case of obviousness.

Thus, the Action has not shown that Welch discloses or suggests all of the claim limitations found in Applicant's independent claims 9 and 15, and as such, the Examiner has not established a prima facie case of obviousness required by MPEP § 2142.

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Claims 10 – 14 and 16 – 19 are dependent upon independent claims 9 and 15 respectively, and thus should be allowable at least through dependency.

In view of the foregoing remarks, Applicant submits that this application is in condition for allowance. Early notification to that effect is respectfully requested.

The Assistant Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to deposit account **04-1679**.

Respectfully submitted,

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